



Armed Forces College of Medicine AFCM



Thoracic wall

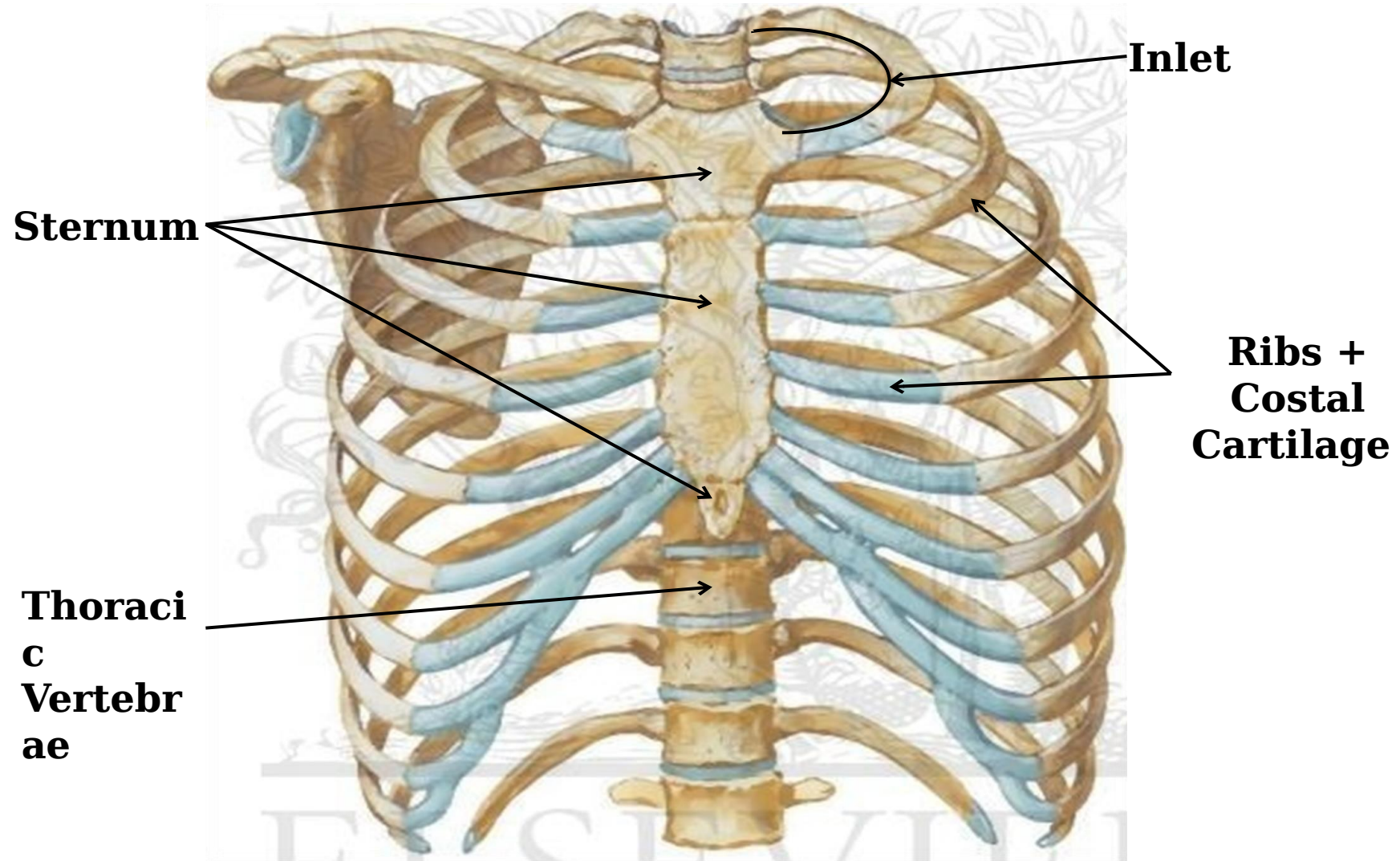
INTENDED LEARNING OBJECTIVES (ILO)



By the end of this section each of the student should be able to:

1. Differentiate between typical and atypical types of different bones of the thorax (ribs and vertebrae)
2. Identify sternum and structures related to it.
3. Identify structures attached or related to ribs and thoracic vertebrae.
4. Identify joints of thoracic wall.

Bones of thoracic cage



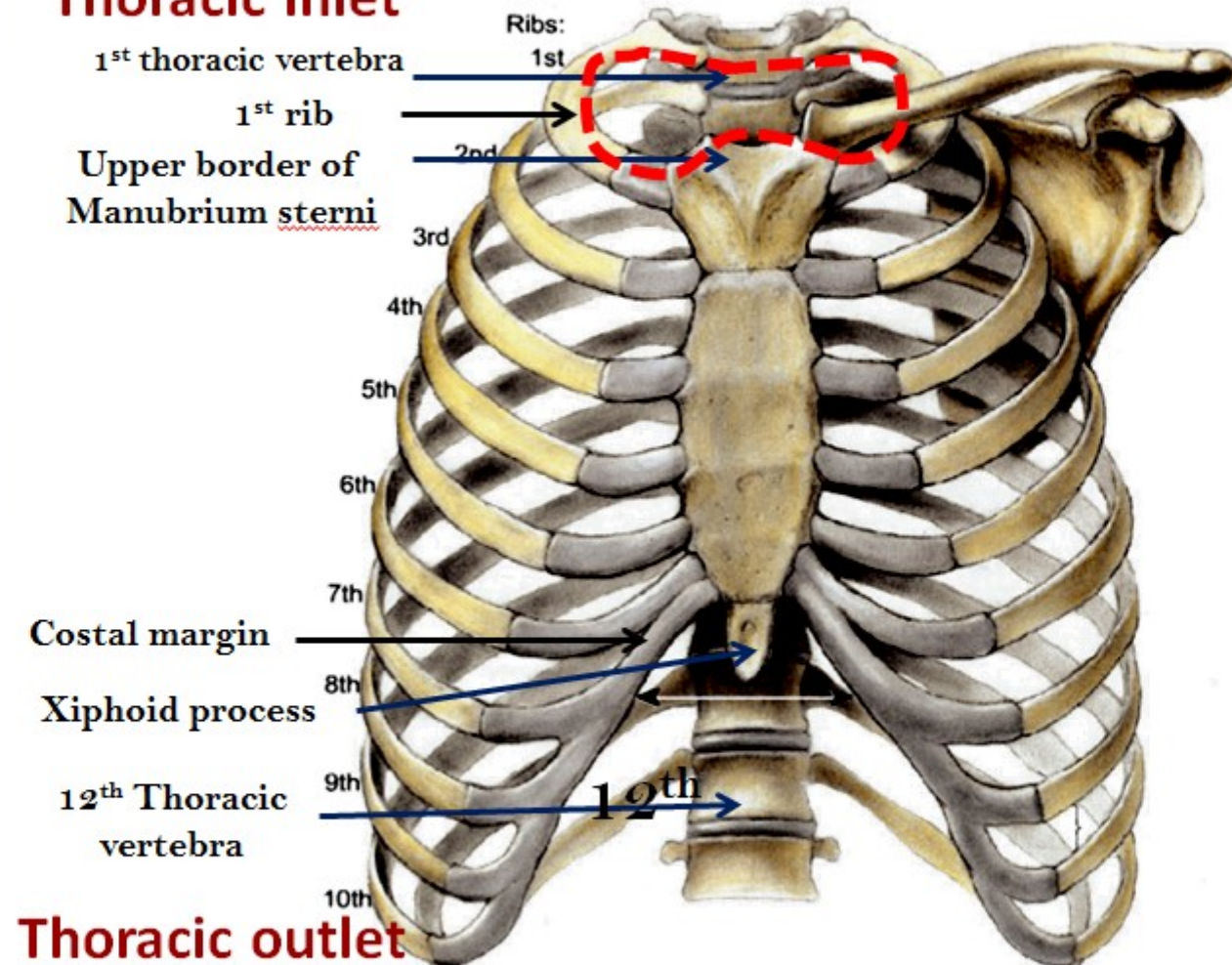
Netter Basic Science: Atlas of Human Anatomy by Frank H. Netter
(Paperback, 6th Edition, 2014)

Anatomy Department

Thoracic inlet and outlet



Thoracic inlet

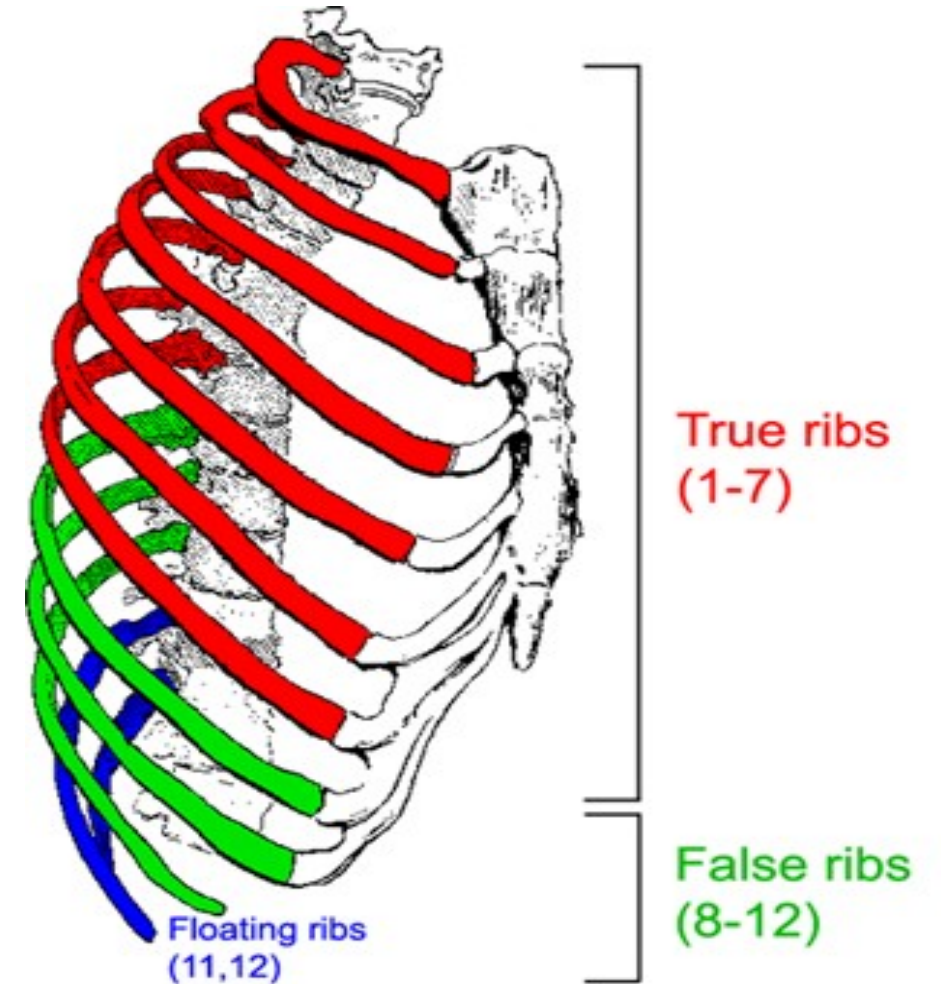


Ribs



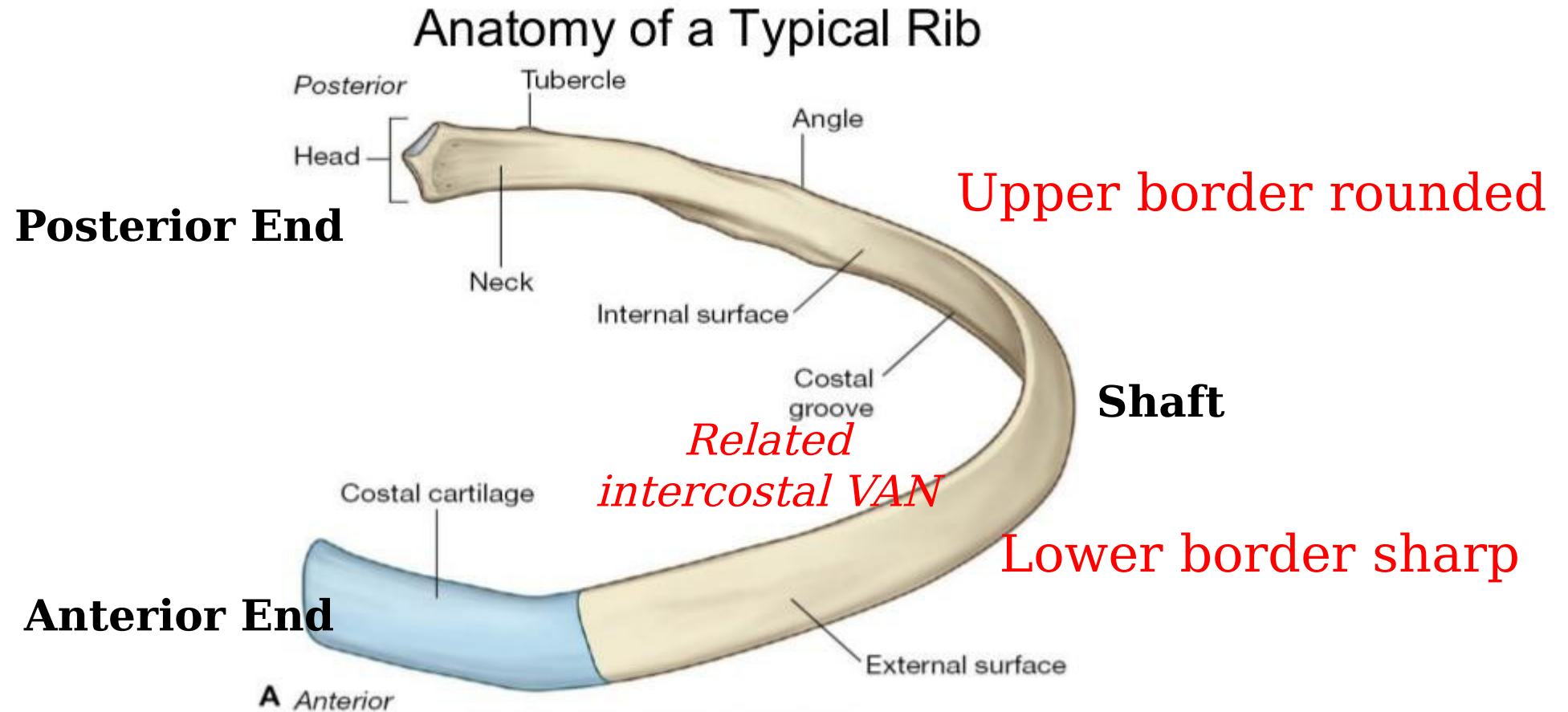
Classification of ribs

Articulation			Shape	
Floating g (11-12)	False (8-9- 10)	True (1-7)	Atypical (1- 2-10-11-12)	Typical (3- 9)



Gray's anatomy for students

Typical rib

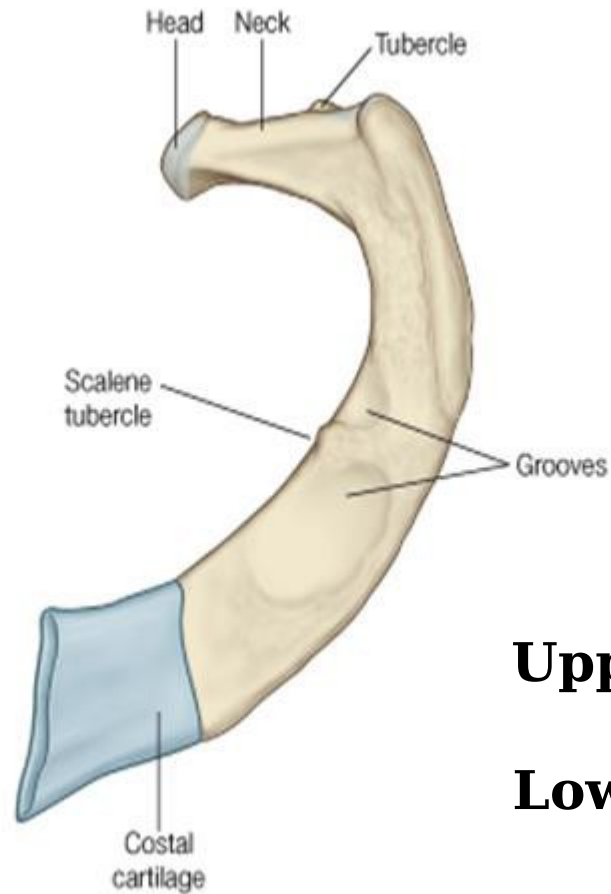


Gray's anatomy for students

1st Rib



Inner border
Sharp
Has **scalene**
tubercle



Outer border
Rounded

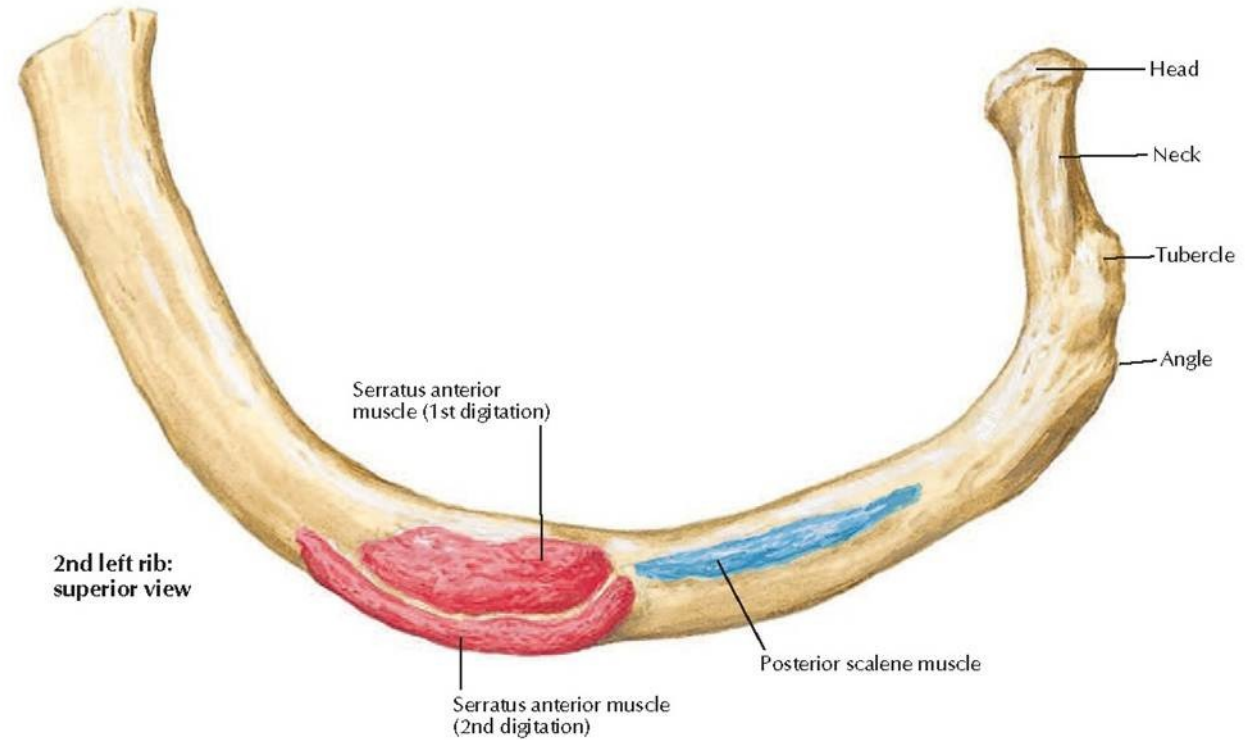
Upper surface
****rough****
Lower surface
****smooth****

Gray's anatomy for students

2nd Rib



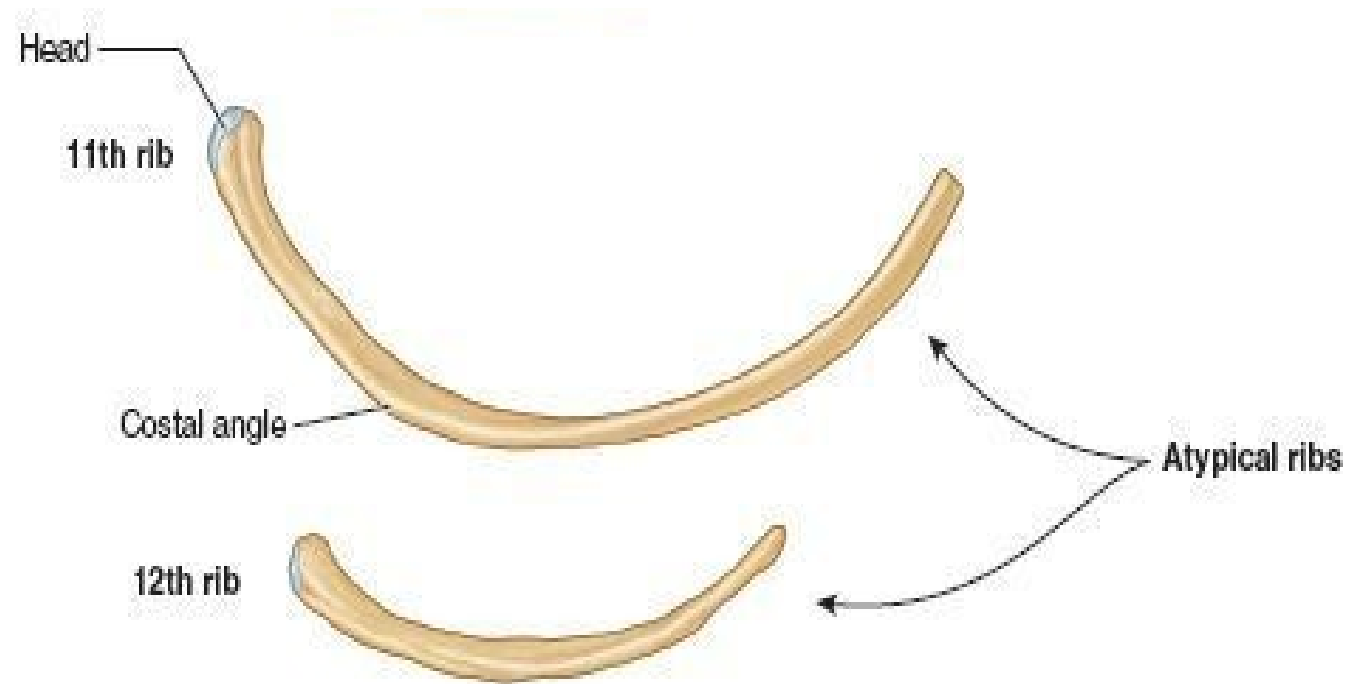
**Thinner and
longer than first
rib**



Floating ribs

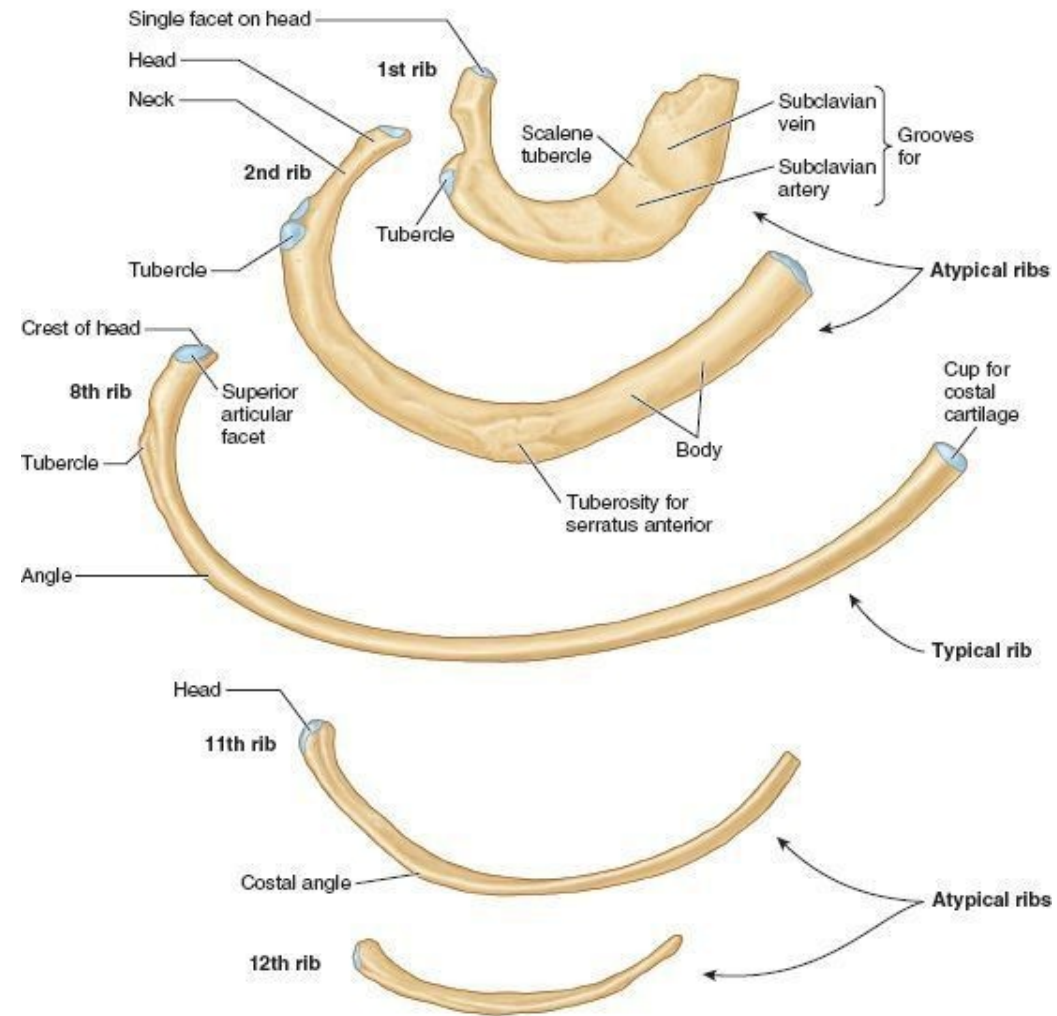


- **The 11th and 12th ribs** are short, have little curve and pointed anteriorly.
- They articulate posteriorly with the vertebrae by a single facet on the head.
- They are devoid of both a tubercle and a subcostal

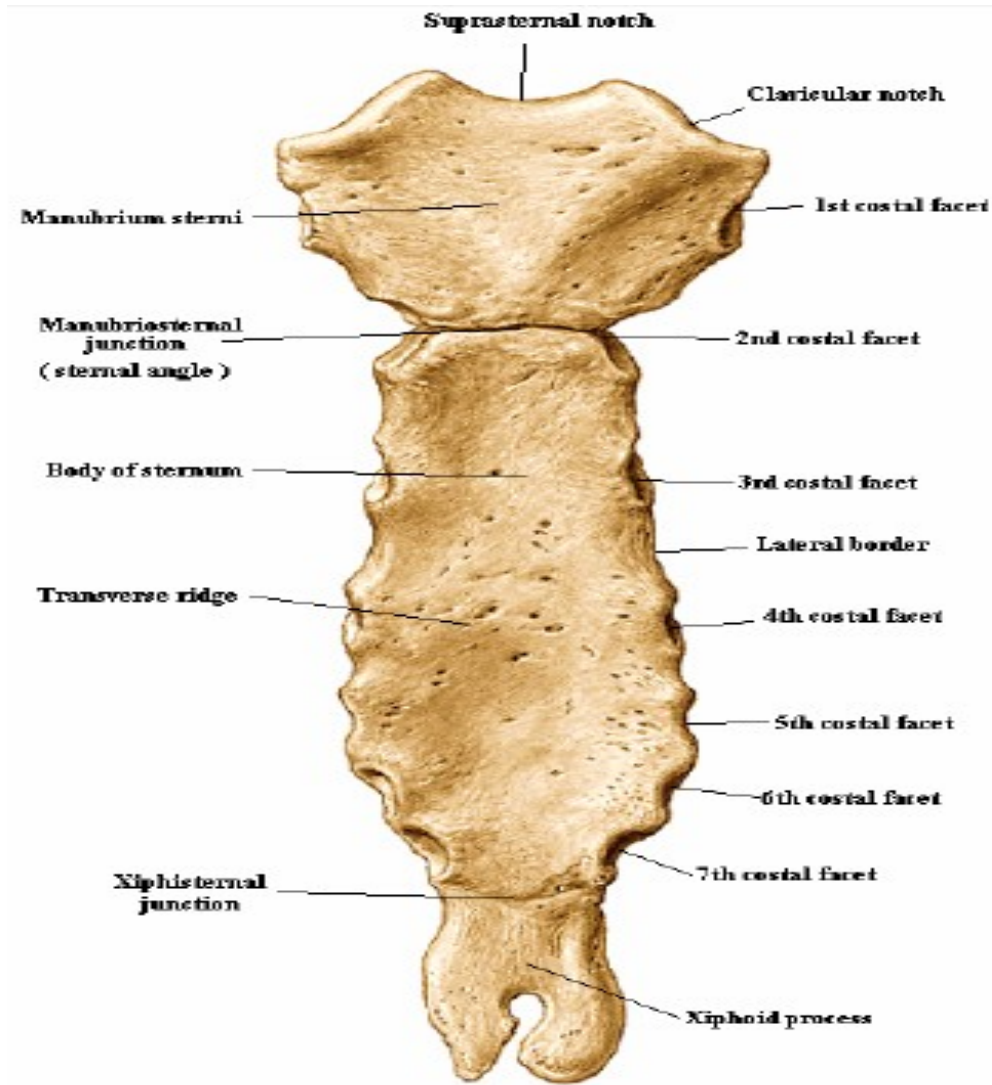


<https://image.slidesharecdn.com/r-a-2-170505030008/95/anatomy-of-the-respiratory-system-2-15-638.jpg?cb=1498248191>

Identify ????

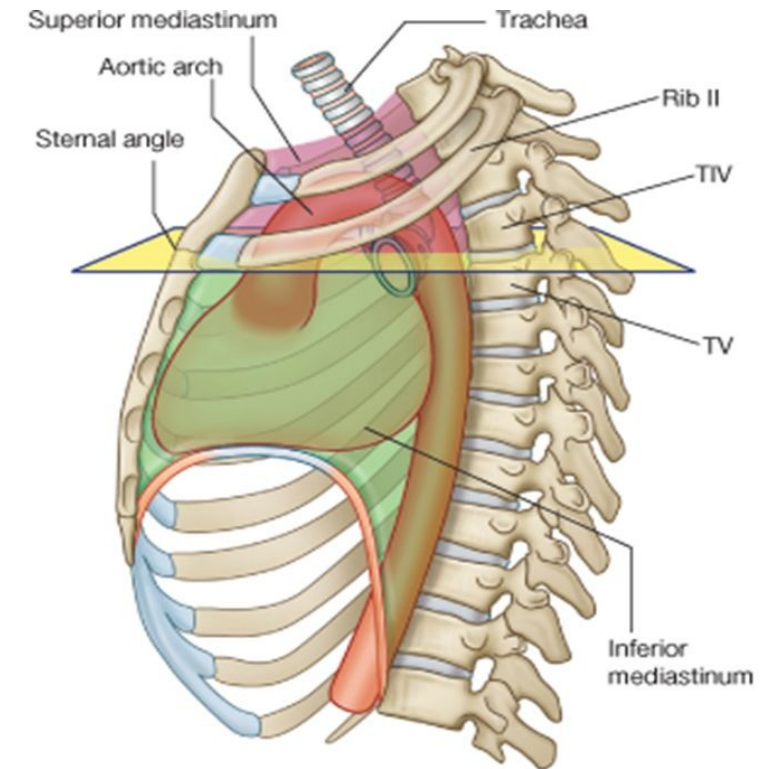
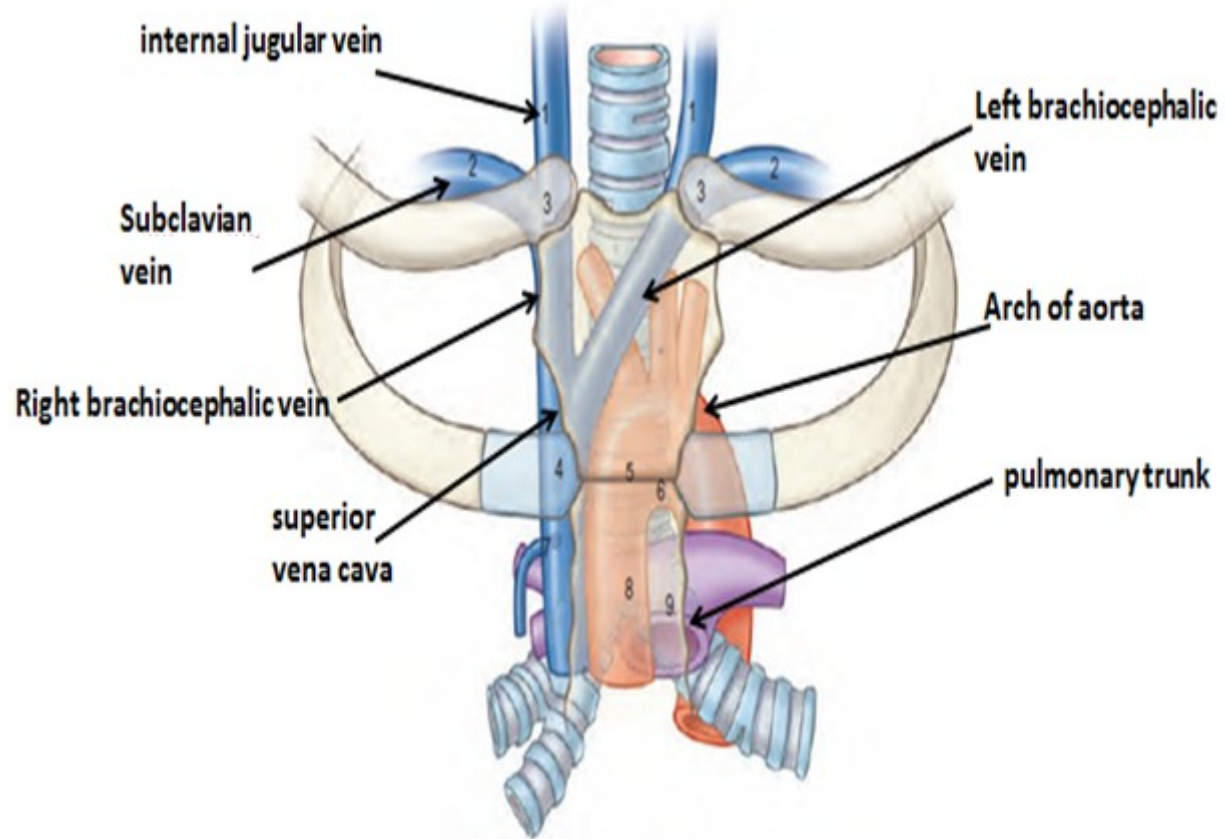


Sternum



Anterior View

Relation of Sternum

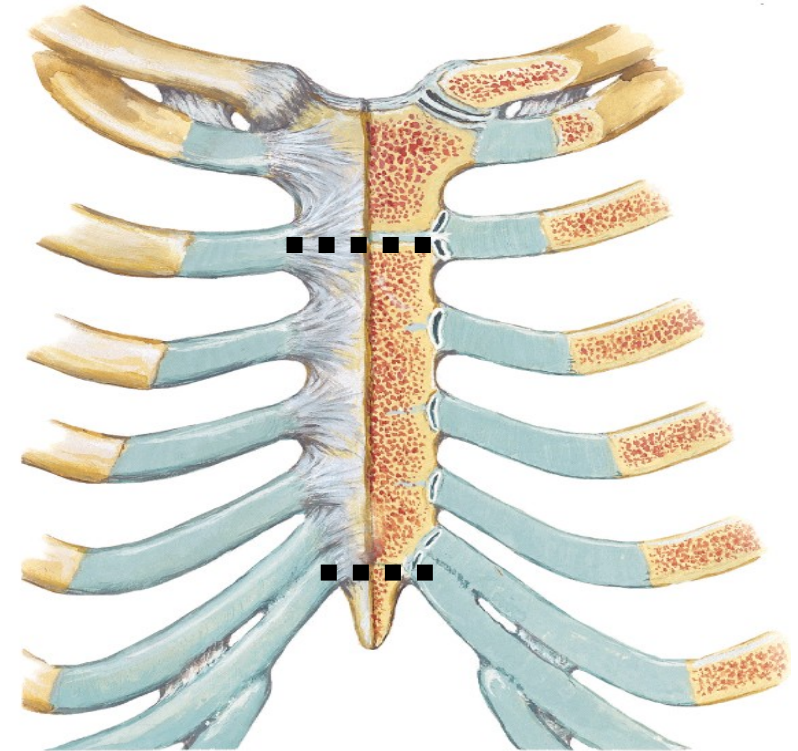


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Sternal joints



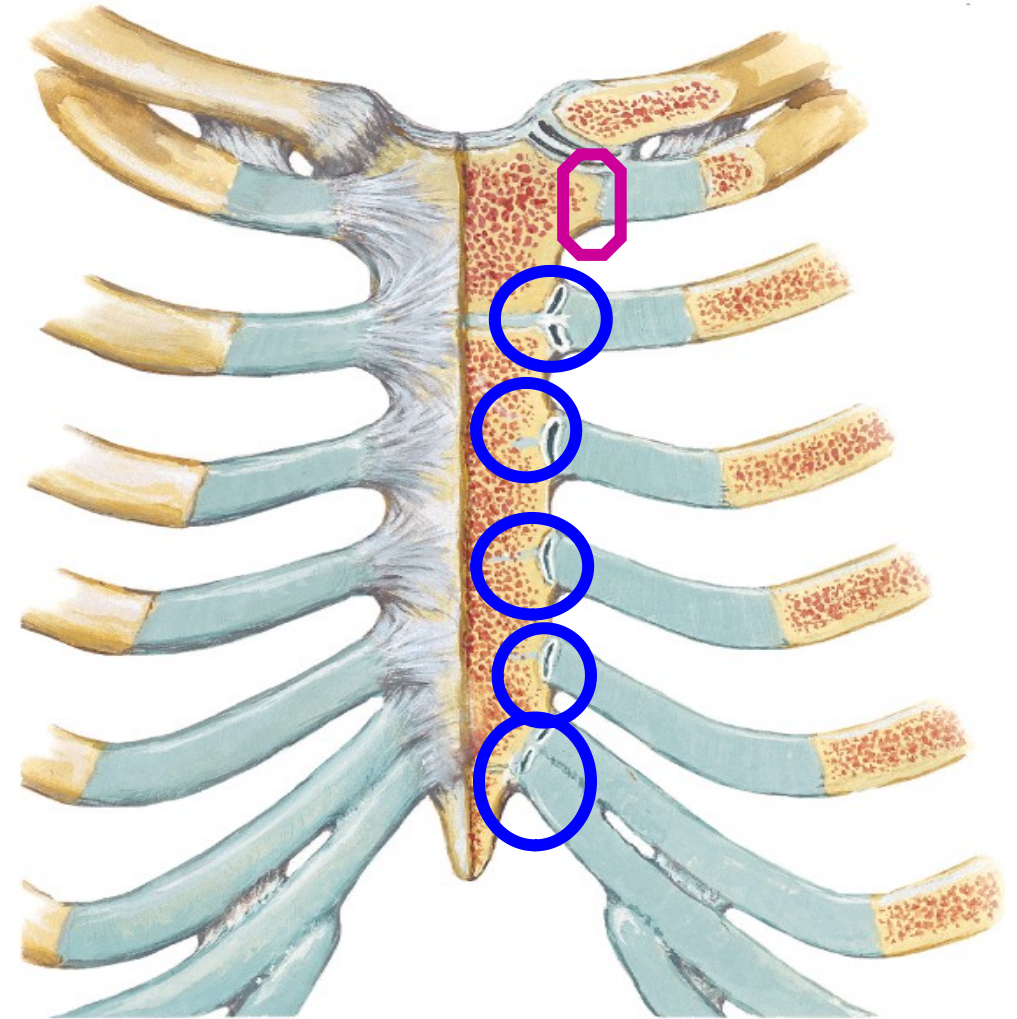
- ❑ Mid line joints are 2ry cartilagenous joints
- ❑ Manubriosternal & xiphisternal joints are both **2ry cartilaginous** joints
- ❑ **May become ossified at old age**



Sternocostal joints



- **Plane synovial joints** between costal cartilages of true ribs & notches on lateral border of sternum
- **EXCEPT FIRST STERNOCOSTAL JOINT** ☐ **PRIMARY CARTILAGINOUS** (direct union between 1st costal cartilage & manubrium sterni)

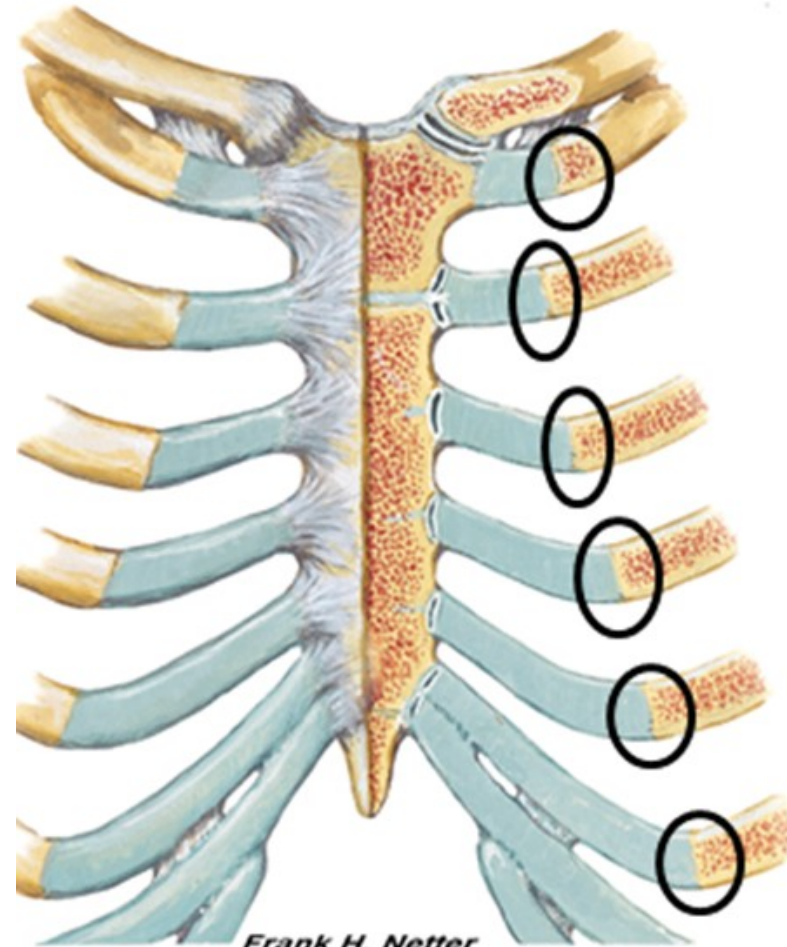


Costochondral joints



- **Costochondral joints:**

Between anterior ends of ribs & corresponding costal cartilages □ 1ry cartilaginous joints □ **NO MOVEMENT ALLOWED**

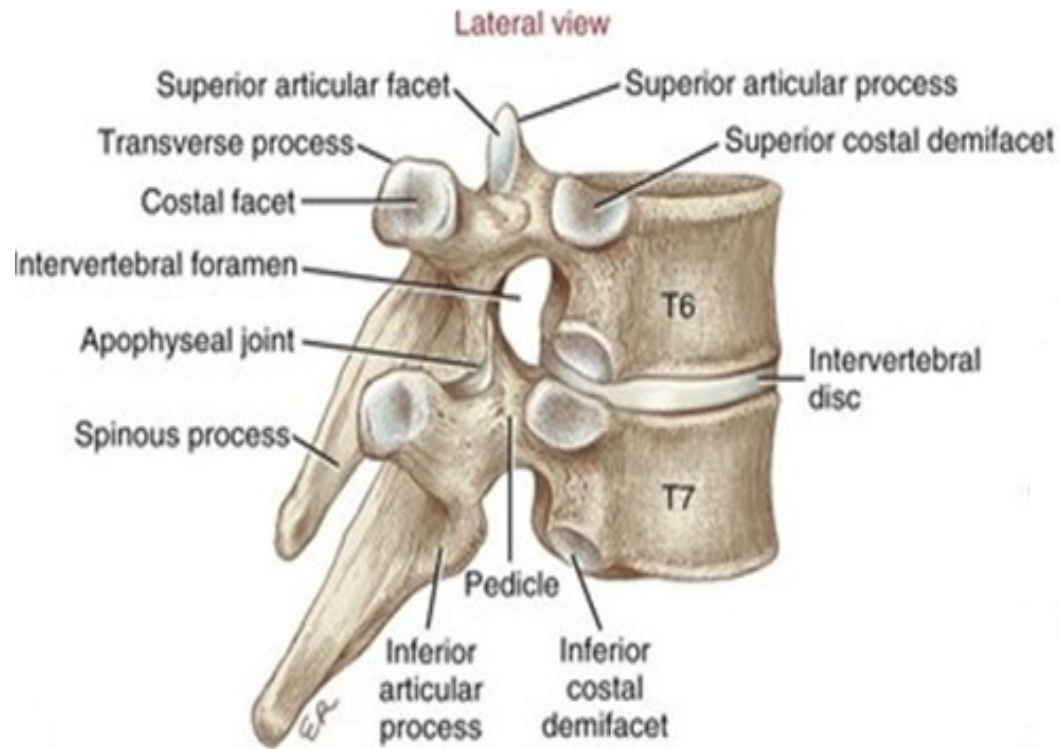


*Frank H. Netter
Atlas of Human Anatomy
6th edition*

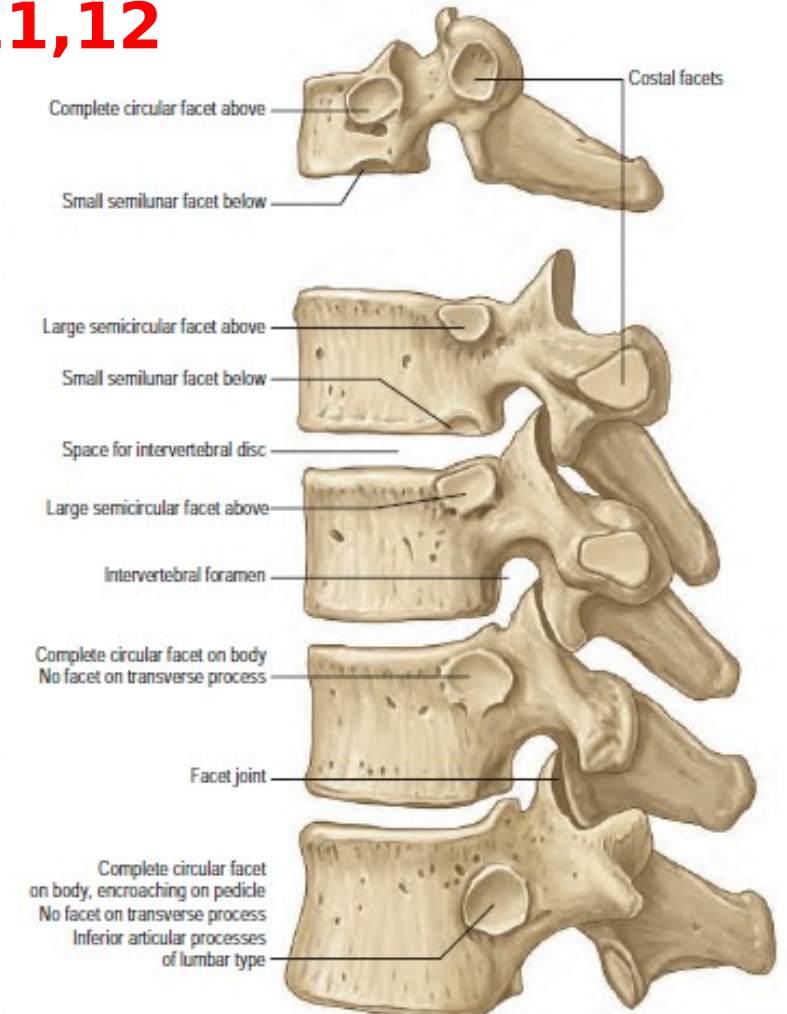
Thoracic vertebrae



□ Typical Thoracic vertebrae 2-7



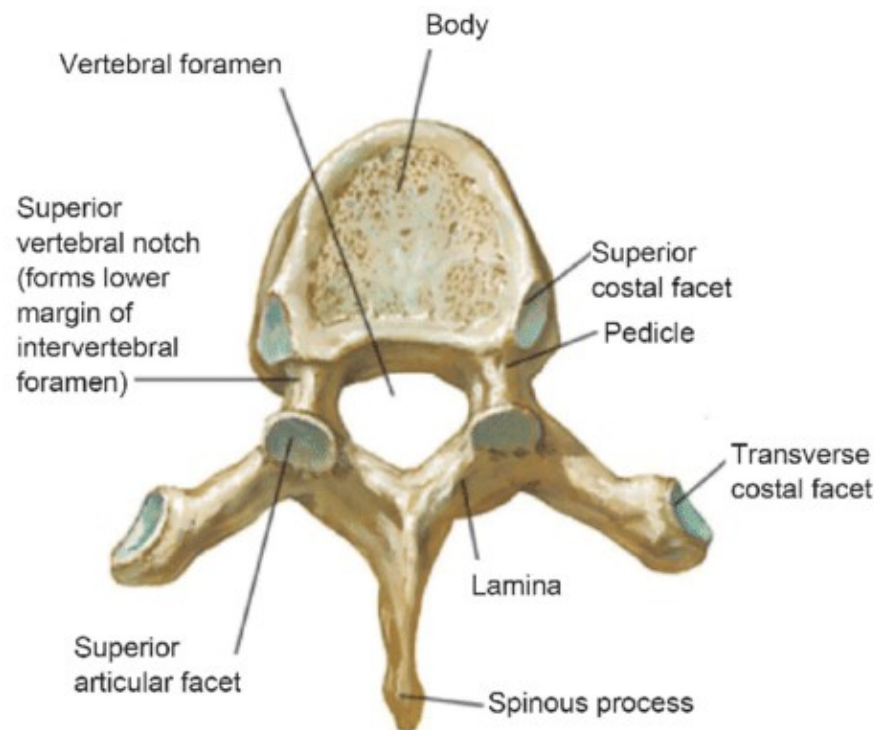
□ Atypical Thoracic vertebrae 1,,9,10,11,12



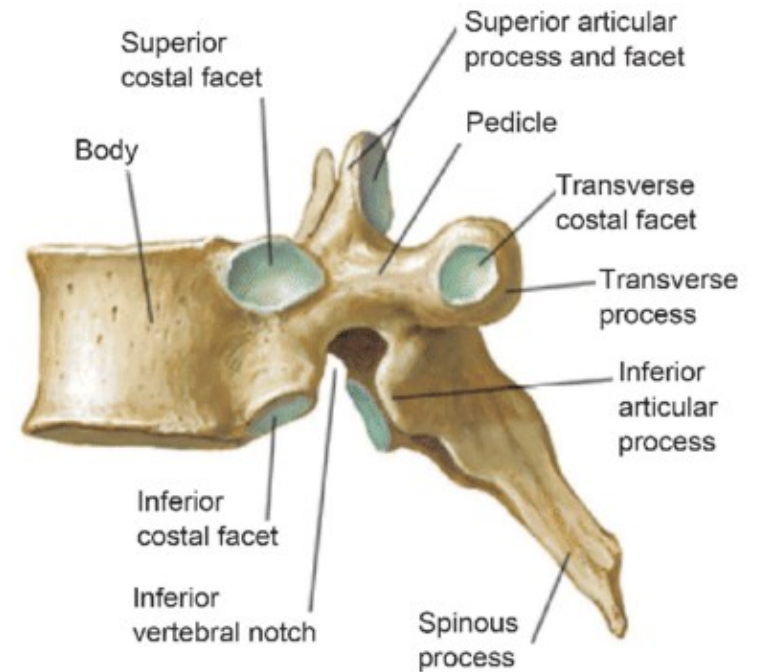
Typical Thoracic vertebrae



- It has circular **body** or heart shape.
- **The spine** is long tapering directed downwards and backwards.
- **The body** has lateral costal facet that articulate with the head of the rib.
- **The transverse processes** also has facet articulate



T6 vertebra:
superior view



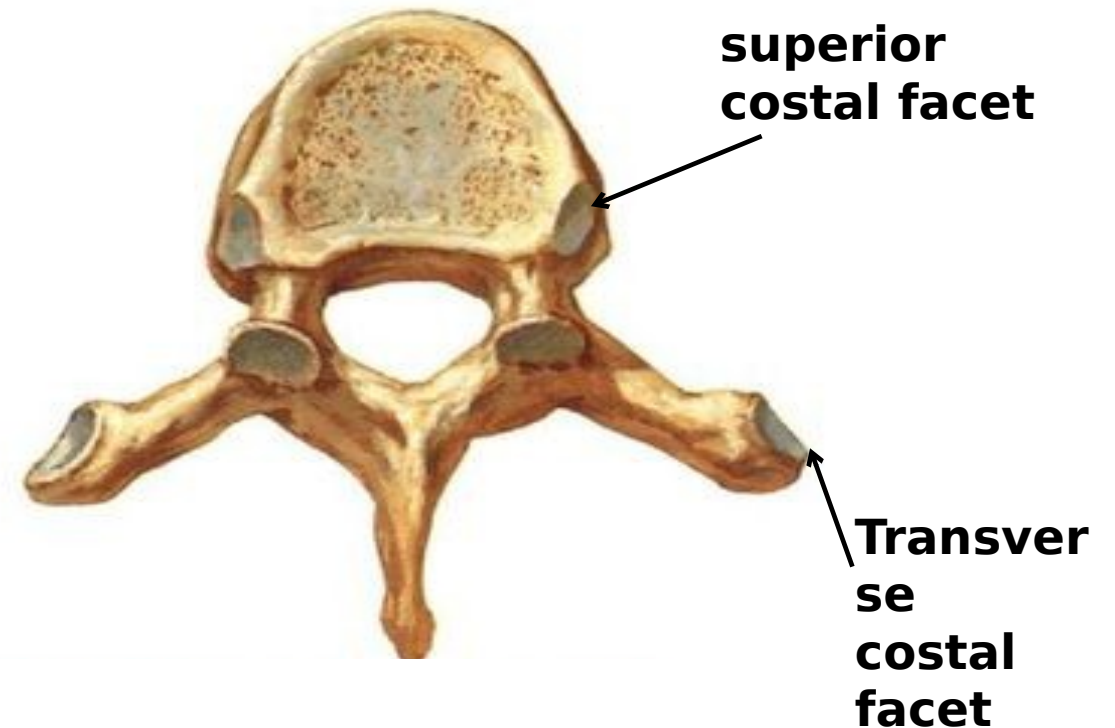
T6 vertebra:
lateral view

Atypical Thoracic vertebrae



❑ First Thoracic vertebrae

- **circular superior costal facet articulates with the whole facet on the head of the first rib.**
- **The smaller, semilunar inferior facet articulates with a demifacet on the head of the second rib.**
- **Small body and long horizontal spine**



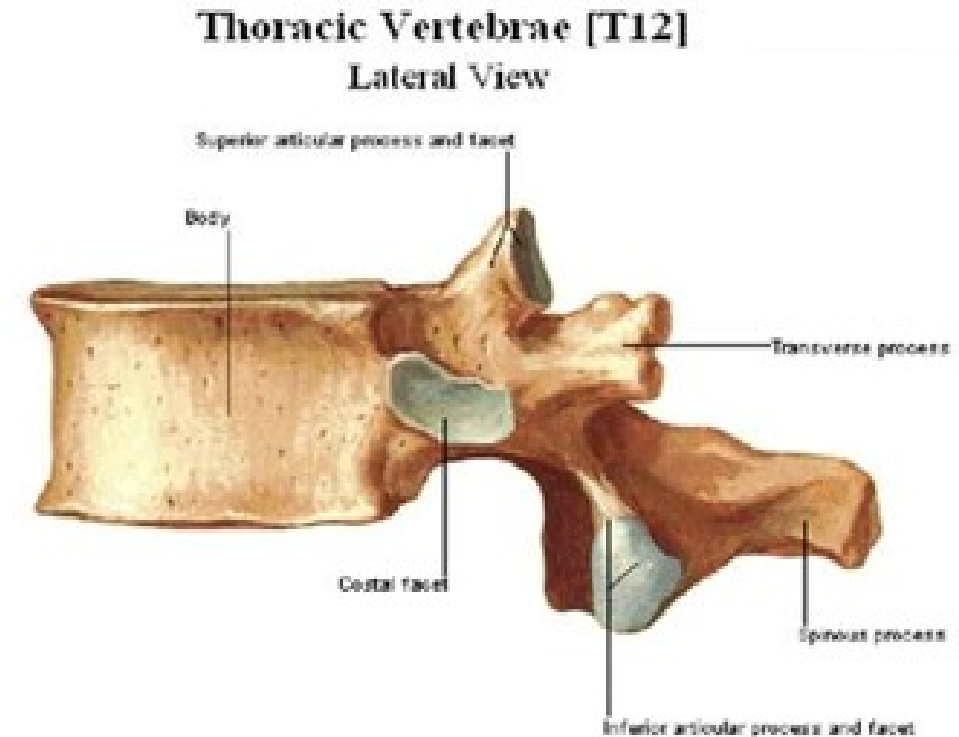
<https://slideplayer.com/slide/14475932/90/images/11/Typical+thoracic+vertebrae%3A+2-9.jpg>

Atypical Thoracic vertebrae



□ 11th and 12th thoracic vertebrae

- Compete facet on the body
- Short blunt spine
- Inferior articular facets of 12th vertebrae are convex and directed laterally.
- No facet on transverse process

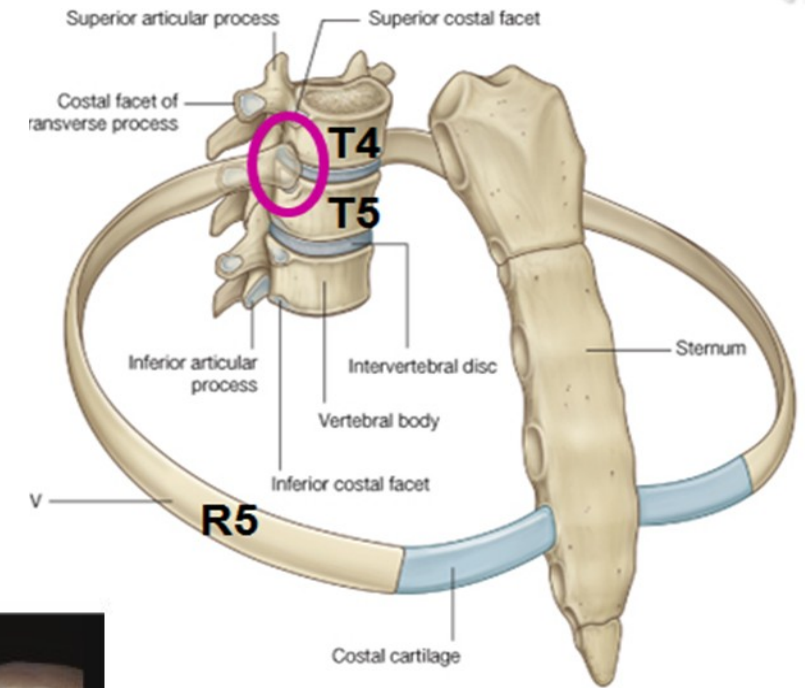


Articulation of vertebrae to rib

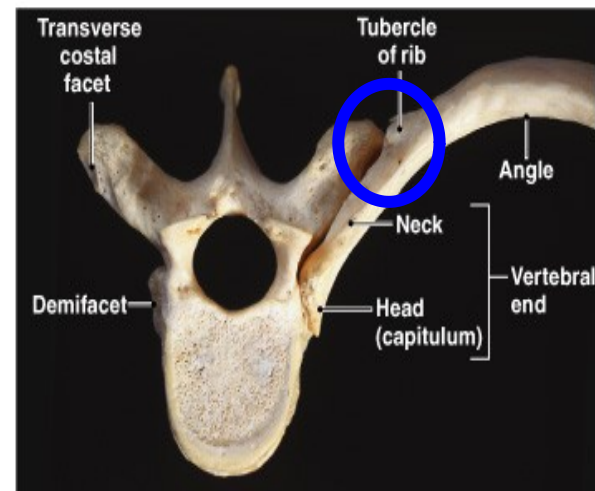


❑ Costovertebral joints

Demifacets on heads of typical ribs articulate with demifacets on bodies of thoracic vertebrae
❑ plane synovial joints



❑ Costotransverse joints
Between tubercles of ribs & transverse processes of vertebrae of same number
❑ plane synovial joints

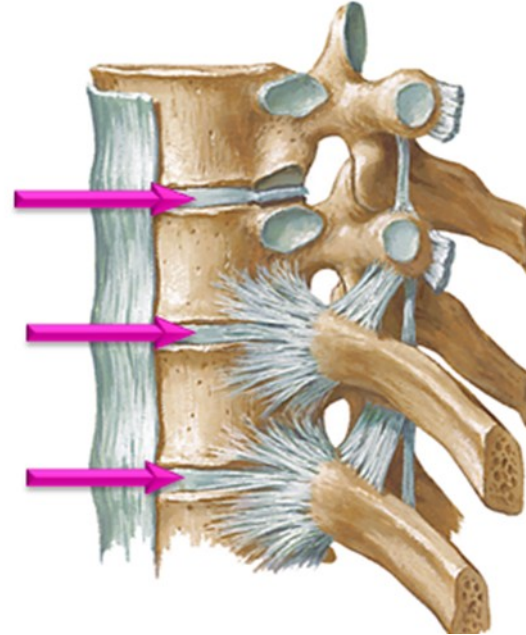


(a) Superior view

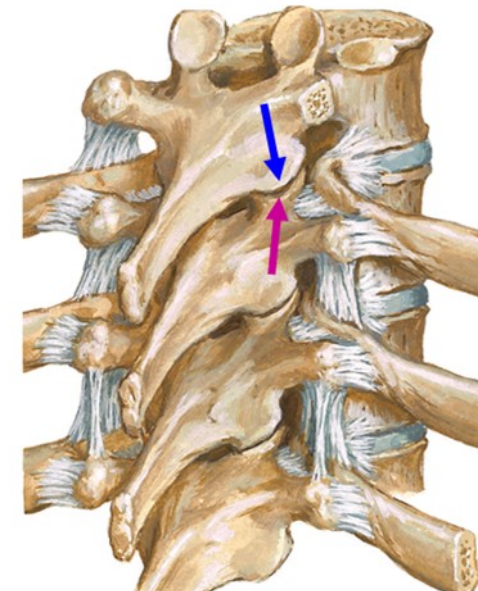
Joints of vertebral column



- Bodies of thoracic vertebrae are connected by intervertebral discs
□ 2ry cartilaginous joints



- Inferior articular facets of vertebrae above articulate with superior articular facets of vertebrae below □ plane synovial joint



Thank you